

T&D Corporation

TR-7wf/nw provider

Version 1.0.0

User's guide

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Remarks:

This document is translated into English by machine translation.

【 revision history 】

Version	Date	Content
1.0.0	2019-7-7	First edition

【 Operation check model 】

Model	Notes
TR-72nw (Only a Japanese version :).	

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1. Introduction

This book is an user's guide of the CAO provider that write/reads data to data logger (TR-7wf/nw) made of T&D. CAO provider (CaoProvTandDTR7nw.dll) that treats in this book is called TR-7wf/nw provider.

The outline of the TR-7wf/nw provider and details of the variable and the command have been described to the chapter 2.

The communication command mounted in the TR-7wf/nw provider must depend on data logger (TR-7wf/nw) that becomes a destination. Refer to "TR-7wf/7nw HTTP communication specifications (Ver0.91)" of the TR-7wf/nw series for details of the communication.

2. Outline of provider

2.1. Outline

The TR-7wf/nw provider operates as HTTP server. Respond to regular POST from the data logger made of T&D, and write/read data.

ACL settings and Firewall settings are required to use this provider. Figure 2-1 shows an image of this promotion and the use of the device.

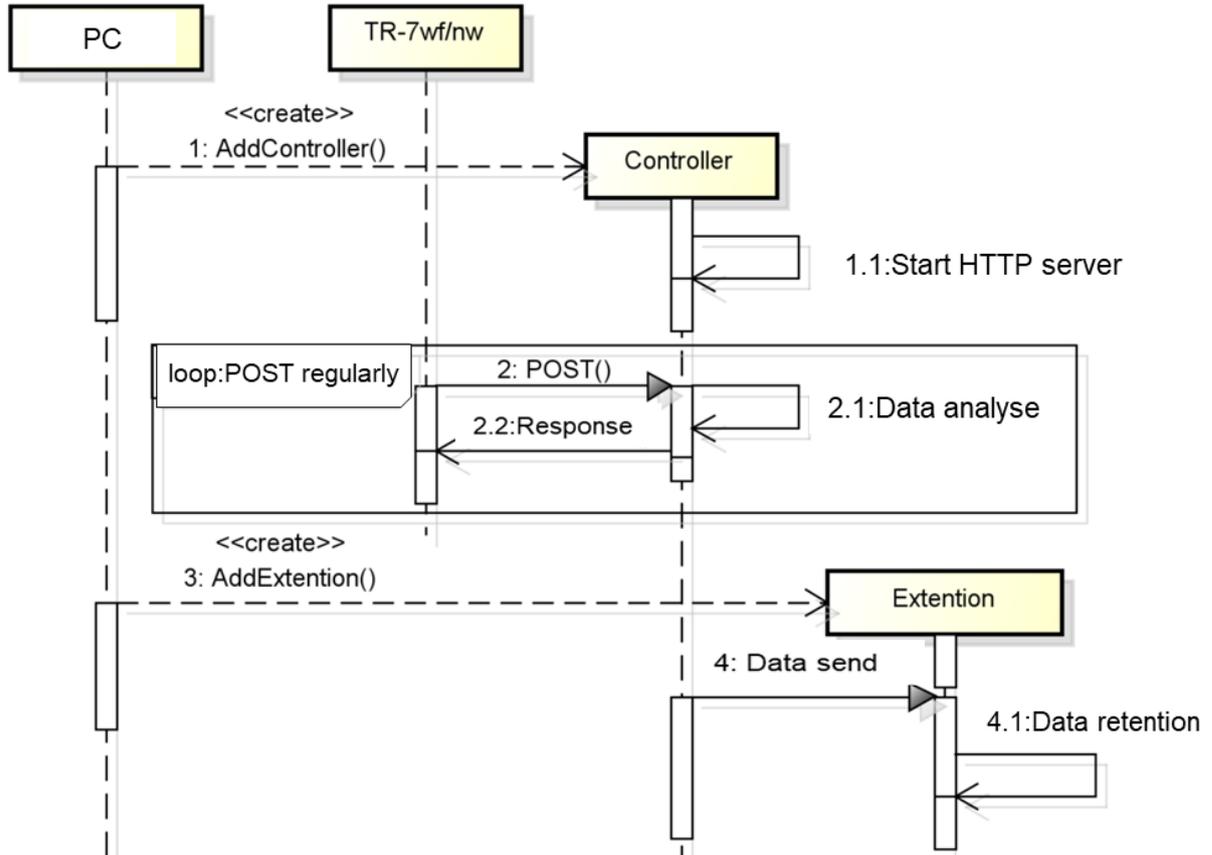


Figure2-1Use image

- The HTTP server starts when the CaoWorkspace::AddController method is executed.
- Manage the data of each referred TR-7nfnw with CaoExtention. Data is managed by CaoExtention for each connected TR-7nfnw. Create a CaoExtention instance by specifying an IP address in the AddExtention method.
- Write/reading each data becomes possible by generating the variable by the CaoExtention::AddVariable method.

The file format of the TR-7wf/nw provider is DLL(Dynamic Link Library), and when using it from the CAO engine, it is dynamically loaded. When the TR-7wf/mw provider is used, it is necessary to install ORiN2SDK or to register the registry by the hand work referring to the table below.

Table2-1TR-7wf/nw provider

File name	CaoProvTandDTR7nw.dll
ProgID	CaoProv.TandD.TR7nw
¹ Registry registration	RegistAsm.bat CaoProvTandDTR7nw.dll
Blotting out of registry registration	UnregistAsm.bat CaoProvTandDTR7nw.dll

¹ bat files(RegistAsm.bat and UnregistAsm.bat) exist in {ORiN2install folder}\¥DotNet¥BAT.

2.2. Method property

2.2.1. CaoWorkspace::AddController method

The TR-7wf / nw provider specifies the destination URI for HTTP server at AddController, and makes HTTP server function listen.

Format AddController (<bstrCtrlName:BSTR>,<bstrProvName:BSTR>,
<bstrPcName:BSTR>, [<bstrOption:BSTR>])

< bstrCtrlName > : In controller name
 < bstrProvName > : In provider name. Fixed value = "CaoProv.TandD.TR7nw"
 <bstrPcName> : Execution machine name of in provider (unused)
 <bstrOption> : In optional character string

The list specified for an optional character string is shown as follows.

Table2-2Optional character string of CaoWorkspace::AddController

Option	Meaning
DEST_URI = < URI of HTTP server>	Indispensability. Specify address URI of the HTTP server. Please refer to capter 5 for details.
TYPE [=<Language type>]	Specify the language type. 0 : JP (default value) 1 : EU 2 : US
ON_MESSAGE [=<TRUE/FALSE>]	Specify the presence of the message when POST responds. (default: TRUE)

- If you execute this method without ACL setting or Firewall setting, error code: 0x80004005: may be returned.

Usage

example

```
var option = "DEST_URI=http://192.168.3.42:80/,TYPE=0,ON_MESSAGE=TRUE";
this.ctrl = this.ws.AddController("Sample","CaoProv.TandD.TR7nw","",option);
```

2.2.2. CaoController::GetVariableNames property

Acquire the list of the shown system variable identifier of chapter 2.3

example

```
var varNames = this.ctrl.get_VariableNames();
```

2.2.3. CaoController::AddVariable method

Make the variable object write/to read reception Internet Protocol address and refusal Internet Protocol address of the HTTP server function.

Format AddVariable (<bstrVariableName:BSTR>, [<bstrOption:BSTR>])

<bstrVariableName > : In variable identifier
<bstrOption> : In optional character string (Do not use it this time).

example

```
var clientIP = this.ctrl.AddVariable("@CLIENT_IP", null);
```

2.2.4. CaoController::Execute method

The Execute method of the CaoController class is a method for the execution of the command. Please refer to chapter 3 for details.

Format Execute (<bstrCommandName:VT_BSTR>,[<vntParam : VT_VARIANT>])

<bstrCommandName> : In command name
<vntParam> : In parameter

example

```
var result = this.ctrl.Execute("Stop",null);
```

2.2.5. CaoController::AddExtention method

The AddExtention method of the CaoController class is a method for making the CaoExtention object. Specify Internet Protocol address of TR-7wf/nw for the method argument.

Format AddExtention(<bstrExtentionName:BSTR>, [<bstrOption:BSTR>])

<bstrExtentionName > : In variable identifier
<bstrOption> : In optional character string

The list specified for an optional character string is shown as follows.

Table2-3Optional character string of CaoController::AddExtention

Option	Meaning
IP =<IP address >	Indispensability. Specify Internet Protocol address of TR-7wf/7nw.

example

```
var extOption = "IP=192.168.3.81";
this.extention = this.ctrl.AddExtension("Sample", extOption);
```

2.2.6. CaoController::OnMessage event

If ON_MESSAGE option of CaoWorkspace :: AddController method is set to TRUE, a message will be thrown when HTTP server responds. Please use it to check the IP address and response timing of the client that HTTP server responded.

Table2-4 Correspondence between Message::Number property and data expression

Number property	Data expression	Data type
1	The format of the message.	BSTR

The format of the message is the following.

{ Internet Protocol address that has done POST } IP: Command: { response command number } Finish.

The response command number is shown in the following lists.

Table2-5Response command number

Number	Meaning
0	The HTTP server responded the error from TR-7wf/nw.

1	The HTTP server responded the demand of data of time from TR-7wf/nw.
2	The HTTP server responded the demand of the operation setting value from TR-7wf/nw. - Data for transmission of operation setting value will be sent
3	The HTTP server responded the recorded data transmission from TR-7wf/nw. - Data is stored in the current value data.
4	The HTTP server responded the operation setting value transmission from TR-7wf/nw. - Data is stored for receiving operation setting values.
5	The HTTP server responded the warning transmission from TR-7wf/nw. - Data is stored in alarm data.

2.2.7. CaoExtention::AddVariable method

Make the variable object write/to read the data of TR-7wf/7nw.

Format AddVariable (<bstrVariableName:BSTR>, [<bstrOption:BSTR>])

< bstrVariableName > : In variable identifier

<bstrOption> : In optional character string (Do not use it this time).

example

```
this.value = this.extention.AddVariable("@FLG_VALUE");
```

2.2.8. CaoVariable::get_Value property

Acquire the value corresponding to the shown system variable of chapter 2.3.

example

```
var val = (int)this.value.Value;
```

2.2.9. CaoVariable::put_Value property

Set the value corresponding to the shown system variable of chapter 2.3.

example

```
int setValue = 0;
this.value.Value = tempValue;
```

2.3. Variable list**2.3.1. CaoController class**

Table2-6CaoController class system variable list

Variable identifier	Data type	Explanation	Attribute	
			get	put
@CLIENT_IP	ARRAY BSTR	The array returns the list of client IP that has done POST to this provider.	✓	-
@DENY_IP	ARRAY BSTR	Return the list of Internet Protocol address that doesn't return the response in this provider by the array.	✓	✓

2.3.2. CaoExtention class

2.3.2.1. For operation setting value transmission

Variable for operation setting value transmission from TR-7wf/nw provider (HTTP server) to TR-7wf/nw.

In the setting of @FLG_VALUE to one,

Transmit the acquisition demand of the value of the variable for the operation setting value in which @FLG_VALUE is excluded to TR-7nfnw.

Renew @FLG_VALUE to 0 in the automatic operation after transmitting the acquisition demand.

Table2-7CaoExtetion class system variable list (for operation setting value transmission)

Variable identifier	Data type	Explanation	Attribute										
			get	put									
@FLG_VALUE	I4	<p>The following are possible by worth and the Flag of operation set up information when POST responds change of the value.</p> <table border="1"> <tr> <td>0</td> <td>:</td> <td>Do not do anything.</td> </tr> <tr> <td>1</td> <td>:</td> <td>Acquisition demand of operation setting value (server → TR-7wf/nw)</td> </tr> <tr> <td>2</td> <td>:</td> <td>Operation setting value transmission request (TR-7wf/nw → server) (Default value)</td> </tr> </table> <p>- 1 The value returns to 0 by the automatic operation after completing the response of or 2.</p>	0	:	Do not do anything.	1	:	Acquisition demand of operation setting value (server → TR-7wf/nw)	2	:	Operation setting value transmission request (TR-7wf/nw → server) (Default value)	✓	✓
0	:	Do not do anything.											
1	:	Acquisition demand of operation setting value (server → TR-7wf/nw)											
2	:	Operation setting value transmission request (TR-7wf/nw → server) (Default value)											
@SET_TIME_DIFF	I2	Time difference (amount) -720-720	✓	✓									
@SET_SUMMER_TIME_FLG	BOOL	<p>Daylight Saving Time</p> <table border="1"> <tr> <td>FALSE</td> <td>:</td> <td>OFF</td> </tr> <tr> <td>TRUE</td> <td>:</td> <td>ON</td> </tr> </table>	FALSE	:	OFF	TRUE	:	ON	✓	✓			
FALSE	:	OFF											
TRUE	:	ON											
@SET_SUMMER_TIME_DIFF	I2	Correction value (amount) Daylight Saving Time default: 60 minutes	✓	✓									
@SET_DEVICE_NAME	BSTR	Equipment name	✓	✓									

Variable identifier	Data type	Explanation	Attribute							
			get	put						
@SET_GROUP_NAME	BSTR	Group name	✓	✓						
@SET_CH1_NAME	BSTR	Ch.1 name	✓	✓						
@SET_CH2_NAME	BSTR	Ch.2 name	✓	✓						
@SET_VIEW_UNIT	UI1	Unit of display <table border="1" data-bbox="756 636 1331 734"> <tr> <td>0</td> <td>:</td> <td>Centigrade (°C)</td> </tr> <tr> <td>1</td> <td>:</td> <td>Fahrenheit (°F)</td> </tr> </table>	0	:	Centigrade (°C)	1	:	Fahrenheit (°F)	✓	✓
0	:	Centigrade (°C)								
1	:	Fahrenheit (°F)								
@SET_CH1_LOW_ENABLE	BOOL	Presence of Ch.1 lower bound warning watch <table border="1" data-bbox="756 790 1331 889"> <tr> <td>FALSE</td> <td>:</td> <td>OFF</td> </tr> <tr> <td>TRUE</td> <td>:</td> <td>ON</td> </tr> </table>	FALSE	:	OFF	TRUE	:	ON	✓	✓
FALSE	:	OFF								
TRUE	:	ON								
@SET_CH1_HIGHT_ENABLE	BOOL	Presence of Ch.1 upper bound warning watch <table border="1" data-bbox="756 945 1331 1043"> <tr> <td>FALSE</td> <td>:</td> <td>OFF</td> </tr> <tr> <td>TRUE</td> <td>:</td> <td>ON</td> </tr> </table>	FALSE	:	OFF	TRUE	:	ON	✓	✓
FALSE	:	OFF								
TRUE	:	ON								
@SET_CH2_LOW_ENABLE	BOOL	Presence of Ch.2 lower bound warning watch <table border="1" data-bbox="756 1099 1331 1198"> <tr> <td>FALSE</td> <td>:</td> <td>OFF</td> </tr> <tr> <td>TRUE</td> <td>:</td> <td>ON</td> </tr> </table>	FALSE	:	OFF	TRUE	:	ON	✓	✓
FALSE	:	OFF								
TRUE	:	ON								
@SET_CH2_HIGHT_ENABLE	BOOL	Presence of Ch.2 upper bound warning watch <table border="1" data-bbox="756 1254 1331 1352"> <tr> <td>FALSE</td> <td>:</td> <td>OFF</td> </tr> <tr> <td>TRUE</td> <td>:</td> <td>ON</td> </tr> </table>	FALSE	:	OFF	TRUE	:	ON	✓	✓
FALSE	:	OFF								
TRUE	:	ON								
@SET_CH1_SENSOR_ENABLE	BOOL	Presence of Ch.1 sensor warning watch <table border="1" data-bbox="756 1408 1331 1507"> <tr> <td>FALSE</td> <td>:</td> <td>OFF</td> </tr> <tr> <td>TRUE</td> <td>:</td> <td>ON</td> </tr> </table>	FALSE	:	OFF	TRUE	:	ON	✓	✓
FALSE	:	OFF								
TRUE	:	ON								
@SET_CH2_SENSOR_ENABLE	BOOL	Presence of Ch.2 sensor warning watch <table border="1" data-bbox="756 1563 1331 1662"> <tr> <td>FALSE</td> <td>:</td> <td>OFF</td> </tr> <tr> <td>TRUE</td> <td>:</td> <td>ON</td> </tr> </table>	FALSE	:	OFF	TRUE	:	ON	✓	✓
FALSE	:	OFF								
TRUE	:	ON								
@SET_CH1_UPPER_LIMIT_VALUE	R4	Refer to @SET_CH1_ATTRIBUTE for the unit of Ch.1 upper bound value preset temperature *.	✓	✓						
@SET_CH1_LOW_VALUE	R4	Refer to @SET_CH1_ATTRIBUTE for the unit of Ch.1 lower bound value preset temperature *.	✓	✓						
@SET_CH1_JUDGE_TIME	UI2	30-65520 in Ch.1 judgment time (second) 60 units	✓	✓						

Variable identifier	Data type	Explanation	Attribute													
			get	put												
@SET_CH2_UPPER_LIMIT_VAL UE	R4	Refer to @SET_CH2_ATTRIBUTE for the unit of Ch.2 upper bound value preset temperature or setting humidity *.	✓	✓												
@SET_CH2_LOW_VALUE	R4	Refer to @SET_CH2_ATTRIBUTE for the unit of Ch.2 lower bound value preset temperature or setting humidity *.	✓	✓												
@SET_CH2_JUDGE_TIME	UI2	Ch.2 judgment time (second) 30-65520 60 units	✓	✓												
@SET_SEND_SAPN	UI4	Automatic transmission interval (second) 60-86400	✓	✓												
@SET_RECORD_SPAN	UI2	Recording interval (second) 1-3600	✓	✓												
@SET_CH1_ATTRIBUTE	UI1	Ch.1 record attribute <table border="1" data-bbox="754 981 1329 1081"> <tr> <td>0x0D</td> <td>:</td> <td>Temperature (°C)</td> </tr> <tr> <td>0x0E</td> <td>:</td> <td>Temperature (F)</td> </tr> </table>	0x0D	:	Temperature (°C)	0x0E	:	Temperature (F)	✓	✓						
0x0D	:	Temperature (°C)														
0x0E	:	Temperature (F)														
@SET_CH2_ATTRIBUTE	UI1	Ch.2 record attribute <table border="1" data-bbox="754 1133 1329 1330"> <tr> <td>0x0D</td> <td>:</td> <td>Temperature (°C)</td> </tr> <tr> <td>0x0E</td> <td>:</td> <td>Temperature (F)</td> </tr> <tr> <td>0xD0</td> <td>:</td> <td>Humidity</td> </tr> <tr> <td>0xD1</td> <td>:</td> <td>Highly accurate humidity</td> </tr> </table> <p>- TR-71wf:0x0D or 0x0E TR-72wf:0xD0 or 0xD1</p>	0x0D	:	Temperature (°C)	0x0E	:	Temperature (F)	0xD0	:	Humidity	0xD1	:	Highly accurate humidity	✓	✓
0x0D	:	Temperature (°C)														
0x0E	:	Temperature (F)														
0xD0	:	Humidity														
0xD1	:	Highly accurate humidity														
@SET_RECORD_MODE	UI1	Record mode <table border="1" data-bbox="754 1480 1329 1574"> <tr> <td>0x00</td> <td>:</td> <td>Endless</td> </tr> <tr> <td>0x80</td> <td>:</td> <td>One time</td> </tr> </table>	0x00	:	Endless	0x80	:	One time	✓	✓						
0x00	:	Endless														
0x80	:	One time														

2.3.2.2. For operation setting value reception

Variable for operation setting value storage received from TR-7wf/nw.

In the setting of @FLG_VALUE to two,

The operation setting value transmission request is transmitted to TR-7nfnw, and the variable for the operation setting value reception is updated to latest information.

Renew @FLG_VALUE to 0 in the automatic operation after transmitting the acquisition demand.

Table2-8CaoExtetion class system variable list (for operation setting value reception)

Variable identifier	Data type	Explanation	Attribute		
			get	put	
@GET_TIME_DIFF	I2	Time difference (amount) -720-720	✓	-	
@GET_SUMMER_TIME_FLG	BOOL	Daylight Saving Time	✓	-	
FALSE		:			OFF
TRUE		:			ON
@GET_SUMMER_TIME_DIFF	I2	Correction value (amount) Daylight Saving Time default: 60 minutes	✓	-	
@GET_DEVICE_NAME	BSTR	Equipment name	✓	-	
@GET_GROUP_NAME	BSTR	Group name	✓	-	
@GET_CH1_NAME	BSTR	Ch.1 name	✓	-	
@GET_CH2_NAME	BSTR	Ch.2 name	✓	-	
@GET_CH1_LOW_ENABLE	BOOL	Presence of Ch.1 lower bound warning watch	✓	-	
FALSE		:			OFF
TRUE		:			ON
@GET_CH1_HIGHT_ENABLE	BOOL	Presence of Ch.1 upper bound warning watch	✓	-	
FALSE		:			OFF
TRUE		:			ON
@GET_CH2_LOW_ENABLE	BOOL	Presence of Ch.2 lower bound warning watch	✓	-	
FALSE		:			OFF
TRUE		:			ON
@GET_CH2_HIGHT_ENABLE	BOOL	Presence of Ch.2 upper bound warning watch	✓	-	

Variable identifier	Data type	Explanation	Attribute	
			get	put
		FALSE : OFF TRUE : ON		
@GET_CH1_SENSOR_ENABLE	BOOL	Presence of Ch.1 sensor warning watch FALSE : OFF TRUE : ON	✓	-
@GET_CH2_SENSOR_ENABLE	BOOL	Presence of Ch.2 sensor warning watch FALSE : OFF TRUE : ON	✓	-
@GET_CH1_UPPER_LIMIT_VALUE	R4	Refer to @GET_CH1_ATTRIBUTE for the unit of Ch.1 upper bound value (record attribute 0x0D and 0x0E commonness) preset temperature *.	✓	-
@GET_CH1_LOW_VALUE	R4	Refer to @GET_CH1_ATTRIBUTE for the unit of Ch.1 lower bound value (record attribute 0x0D and 0x0E commonness) preset temperature *.	✓	-
@GET_CH1_JUDGE_TIME	UI2	Ch.1 judgment time (second) 30-65520 60 units	✓	-
@GET_CH2_UPPER_LIMIT_VALUE	R4	Refer to @GET_CH2_ATTRIBUTE for the unit of Ch.2 upper bound value 2UI1 preset temperature or setting humidity *.	✓	-
@GET_CH2_LOW_VALUE	R4	Refer to @GET_CH2_ATTRIBUTE for the unit of Ch.2 lower bound value 2UI1 preset temperature or setting humidity *.	✓	-
@GET_CH2_JUDGE_TIME	UI2	Ch.2 judgment time (second) 30-65520 60 units	✓	-
@GET_SEND_SPAN	UI4	Automatic transmission interval (second) 60-86400	✓	-
@GET_RECORD_SPAN	UI2	Recording interval (second) 1-3600	✓	-
@GET_CH1_ATTRIBUTE	UI1	Ch.1 record attribute 0x0D : Temperature (°C) 0x0E : Temperature (F)	✓	-

Variable identifier	Data type	Explanation	Attribute																										
			get	put																									
@GET_CH2_ATTRIBUTE	UI1	Ch.2 record attribute <table border="1"> <tr> <td>0x0D</td> <td>:</td> <td>Temperature (°C)</td> </tr> <tr> <td>0x0E</td> <td>:</td> <td>Temperature (F)</td> </tr> <tr> <td>0xD0</td> <td>:</td> <td>Humidity</td> </tr> <tr> <td>0xD1</td> <td>:</td> <td>Highly accurate humidity</td> </tr> </table> - TR-71wf:0x0D or 0x0E TR-72wf:0xD0 or 0xD1	0x0D	:	Temperature (°C)	0x0E	:	Temperature (F)	0xD0	:	Humidity	0xD1	:	Highly accurate humidity	✓	-													
0x0D	:	Temperature (°C)																											
0x0E	:	Temperature (F)																											
0xD0	:	Humidity																											
0xD1	:	Highly accurate humidity																											
@GET_RECORD_MODE	UI1	Record mode <table border="1"> <tr> <td>0x00</td> <td>:</td> <td>Endless</td> </tr> <tr> <td>0x80</td> <td>:</td> <td>One time</td> </tr> </table>	0x00	:	Endless	0x80	:	One time	✓	-																			
0x00	:	Endless																											
0x80	:	One time																											
@SERIAL_NO	UI4	Serial number 4UI1 <table border="1"> <tr> <td rowspan="2">JP</td> <td>TR-71wf:</td> <td>52120000~3FFFF</td> </tr> <tr> <td>TR-72wf:</td> <td>52140000~5FFFF</td> </tr> <tr> <td rowspan="2">EU</td> <td>TR-71wf:</td> <td>42120000~3FFFF</td> </tr> <tr> <td>TR-72wf:</td> <td>42140000~5FFFF</td> </tr> <tr> <td rowspan="2">US</td> <td>TR-71wf:</td> <td>32120000~3FFFF</td> </tr> <tr> <td>TR-72wf:</td> <td>32140000~5FFFF</td> </tr> <tr> <td rowspan="2">JP</td> <td>TR-71nw:</td> <td>52160000~3FFFF</td> </tr> <tr> <td>TR-72nw:</td> <td>52180000~3FFFF</td> </tr> <tr> <td rowspan="2">Ano ther</td> <td>TR-71nw:</td> <td>62160000~3FFFF</td> </tr> <tr> <td>TR-72nw:</td> <td>62180000~3FFFF</td> </tr> </table>	JP	TR-71wf:	52120000~3FFFF	TR-72wf:	52140000~5FFFF	EU	TR-71wf:	42120000~3FFFF	TR-72wf:	42140000~5FFFF	US	TR-71wf:	32120000~3FFFF	TR-72wf:	32140000~5FFFF	JP	TR-71nw:	52160000~3FFFF	TR-72nw:	52180000~3FFFF	Ano ther	TR-71nw:	62160000~3FFFF	TR-72nw:	62180000~3FFFF	✓	-
JP	TR-71wf:	52120000~3FFFF																											
	TR-72wf:	52140000~5FFFF																											
EU	TR-71wf:	42120000~3FFFF																											
	TR-72wf:	42140000~5FFFF																											
US	TR-71wf:	32120000~3FFFF																											
	TR-72wf:	32140000~5FFFF																											
JP	TR-71nw:	52160000~3FFFF																											
	TR-72nw:	52180000~3FFFF																											
Ano ther	TR-71nw:	62160000~3FFFF																											
	TR-72nw:	62180000~3FFFF																											
@DEVICE_VER	I2	100 examples of 0-9999 firmware version values = version: 214→Ver2.14	✓	-																									
@DEVICE_POWER	UI1	Battery power (battery level) 0-5	✓	-																									
@RECORD_STATUS	UI1	State of record <table border="1"> <tr> <td>0x00</td> <td>:</td> <td>It is stopping.</td> </tr> <tr> <td>0x01</td> <td>:</td> <td>It is recording.</td> </tr> <tr> <td>0x02</td> <td>:</td> <td>Reservation beginning waiting</td> </tr> </table>	0x00	:	It is stopping.	0x01	:	It is recording.	0x02	:	Reservation beginning waiting	✓	-																
0x00	:	It is stopping.																											
0x01	:	It is recording.																											
0x02	:	Reservation beginning waiting																											
@CH1_SLOPE	I2	-1000 examples of 0-65535 Ch.1 inclination values = inclination: 1100→ inclination is 1.1.	✓	-																									
@CH1_SEGMENT	I2	-1000 examples of 0-65535 Ch.1 cut values = cut: 2400→ cut is 2.4.	✓	-																									

Variable identifier	Data type	Explanation	Attribute	
			get	put
@CH2_SLOPE	I2	-1000 examples of 0-65535 Ch.2 inclination values = inclination: 1600→ inclination is 1.6.	✓	-
@CH2_SEGMENT	I2	-1000 examples of 0-65535 Ch.2 cut values = cut: 3000→ cut is 3.0.	✓	-
@RECORD_START_STAUS	UI1	State of record beginning	✓	-
		0x00 : At once		
		0x01 : Reservation		
		0x02 : Manual		
@AUTO_SEND_PRESENCE	UI1	Presence of automatic transmission at specified intervals	✓	-
		0 : Invalidity		
		1 : Effective		
@REGISTER_CODE	UI4	Registration code 0x00000000-0x99999999	✓	-
@BACKUP_STATUS	UI1	Recorded backup (since TR-7wf Ver.104)	✓	-
@MAC_ADDRES	ARRA Y UI1	MAC address (Only TR-7nw :).	✓	-

2.3.2.3. Value data of present

Variable for storage of value data of present when it is transmitted regularly from TR-7wf/nw

Table2-9CaoExtetion class system variable list (value data of present)

Variable identifier	Data type	Explanation	Attribute	
			get	put
@CURRENT_DATA_SERIAL	BSTR	Serial number of main phone	✓	-
@CURRENT_DATA_MODEL	BSTR	Serial number of main phone	✓	-
@CURRENT_DATA_NAME	BSTR	Main phone name	✓	-
@CURRENT_DATA_TIME_DIFF	I4	Conversion type local_time of UTC at offset UTC (The unit:) - local time = UTC + time_diff + std_bias (During standard time) local_time = UTC + time_diff + example of dst_bias (summer time inside)) Japan: 540 :-480 at/Pacific Ocean standard.	✓	-
@CURRENT_DATA_STD_BIAS	I4	Offset of standard time (amount)	✓	-
@CURRENT_DATA_DST_BIAS	I4	Offset of summer time (The unit:).	✓	-
@CURRENT_DATA_TIME_ZONE	BSTR	Character string that shows time zone	✓	-
@CURRENT_DATA_GROUP_NUMBER	I4	Group number	✓	-
@CURRENT_DATA_GROUP_NAME	BSTR	Group name	✓	-
@CURRENT_DATA_REMORT_SERIAL	BSTR	Serial number of cordless handset	✓	-
@CURRENT_DATA_REMORT_MODEL	BSTR	Serial number of cordless handset	✓	-
@CURRENT_DATA_REMORT_NUMBER	I4	Cordless handset number	✓	-
@CURRENT_DATA_REMORT_NAME	BSTR	Cordless handset name	✓	-

Variable identifier	Data type	Explanation	Attribute	
			get	put
@CURRENT_DATA_REMORT_R SSI	BSTR	The main phone (relay machine) electric wave strength 5 between -cordless handsets: It is strong 1: weak 0: It is not possible to communicate.	✓	-
@CURRENT_DATA_CH1_NUM	BSTR	Ch.1 channel number	✓	-
@CURRENT_DATA_CH1_SCALE_EXPR	BSTR	Refer to Ch.1 scale conversion type. (refer chapter 5.3)	✓	-
@CURRENT_DATA_CH1_NAME	BSTR	Ch.1 channel name	✓	-
@CURRENT_DATA_CH1_UNIX_TIME	UI4	Time of value as of Ch.1 (world agreement time (UTC) passage second number from January 1, 1970)	✓	-
@CURRENT_DATA_CH1_TIME_STR	BSTR	Character string of time of value as of Ch.1 (local time converted by using time difference information on main phone information)	✓	-
@CURRENT_DATA_CH1_VALUE	BSTR	When not worth @CURRENT_DATA_CH1_SCALE_EXPR that reaches the value in which the scale is converted when value @CURRENT_DATA_CH1_SCALE_EXPR includes the value as of Ch.1 It becomes a value shown with @CURRENT_DATA_CH1_UNIT.	✓	-
@CURRENT_DATA_CH1_UNIT	BSTR	When there is a value for unit @CURRENT_DATA_CH1_SCALE_EXPR of the value as of Ch.1 It becomes a unit specified by the scale conversion type.	✓	-
@CURRENT_DATA_CH1_BATT	BSTR	Battery power of cordless handset (5: a certain-0: It is not) and -1: The equipment without battery remainder amount information.	✓	-
@CURRENT_DATA_CH2_NUM	BSTR	Ch.2 channel number	✓	-

Variable identifier	Data type	Explanation	Attribute	
			get	put
@CURRENT_DATA_CH2_SCALE_EXPR	BSTR	Refer to Ch.2 scale conversion type. (refer to chapter 5.3)	✓	-
@CURRENT_DATA_CH2_NAME	BSTR	Ch.2 channel name	✓	-
@CURRENT_DATA_CH2_UNIX_TIME	UI4	Time of value as of Ch.2 (world agreement time (UTC) passage second number from January 1, 1970)	✓	-
@CURRENT_DATA_CH2_TIME_STR	BSTR	Character string of time of value as of Ch.2 (local time converted by using time difference information on main phone information)	✓	-
@CURRENT_DATA_CH2_VALUE	BSTR	To @CURRENT_DATA_CH2_SCALE_EXPR that reaches the value in which the scale is converted, except for no rugged value when value @CURRENT_DATA_CH2_SCALE_EXPR includes the value as of Ch.2 It becomes a value shown with @CURRENT_DATA_CH2_UNIT.	✓	-
@CURRENT_DATA_CH2_UNIT	BSTR	When there is a value for unit @CURRENT_DATA_CH2_SCALE_EXPR of the value as of Ch.2 It becomes a unit specified by the scale conversion type.	✓	-
@CURRENT_DATA_CH2_BATT	BSTR	Battery power of Ch.2 cordless handset (5: a certain- 0: It is not) and -1: The equipment without battery remainder amount information.	✓	-

2.3.2.4. Warning data

Variable for storage of warning data transmitted when warning from TR-7wf/nw

Table2-10CaoExtetion class system variable list (warning data)

Variable identifier	Data type	Explanation	Attribute													
			get	put												
@CURRENT_DATA_CH2_BATT	BSTR	Battery power of Ch.2 cordless handset (5: a certain- 0: It is not) and -1: The equipment without battery remainder amount information.	✓	-												
@WARNING_CREATED_TIME	I4	Time when this file was made (world agreement time (UTC) passage second number from January 1, 1970)	✓	-												
@WARNING_TIME_DIFF	I4	Conversion type local_time of UTC at offset UTC (The unit:) - local time = UTC + time_diff + std_bias local_time (During standard time) = UTC + time_diff + example of dst_bias (summer time inside)) book: 540 :-480 at/Pacific Ocean standard.	✓	-												
@WARNING_STD_BIAS	I4	Offset of standard time (The unit:).	✓	-												
@WARNING_DST_BIAS	I4	Offset of summer time (The unit:).	✓	-												
@WARNING_DEVICE_SERIAL_NUM	BSTR	Serial number of equipment	✓	-												
@WARNING_DEVICE_MODEL_NUM	BSTR	Serial number of equipment	✓	-												
@WARNING_DEVICE_NAME	BSTR	Equipment name	✓	-												
@WARNING_CH1_NUM	I4	Channel number	✓	-												
@WARNING_CH1_STATE	I4	Ch1 . State of warning <table border="1" data-bbox="751 1738 1329 1980"> <tr> <td>0</td> <td>:</td> <td>Uncertainty</td> </tr> <tr> <td>1</td> <td>:</td> <td>Normality (There is not warning).</td> </tr> <tr> <td>2</td> <td>:</td> <td>Warning that exceeds the upper bound value is being generated.</td> </tr> <tr> <td>3</td> <td>:</td> <td>Warning that falls below the lower</td> </tr> </table>	0	:	Uncertainty	1	:	Normality (There is not warning).	2	:	Warning that exceeds the upper bound value is being generated.	3	:	Warning that falls below the lower	✓	-
0	:	Uncertainty														
1	:	Normality (There is not warning).														
2	:	Warning that exceeds the upper bound value is being generated.														
3	:	Warning that falls below the lower														

Variable identifier	Data type	Explanation		Attribute	
				get	put
			bound value is being generated.		
		4	: The sensor error warning is being generated.		
@WARNING_CH1_NAME	BSTR	Ch1 . Channel name		✓	-
@WARNING_CH1_UNIX_TIME	I4	Ch1 . Time (world agreement time (UTC) passage second number from January 1, 1970)		✓	-
@WARNING_CH1_ID	I4	Ch1 . Identification number One increase whenever warning is generated (Return to 0 when 255 is exceeded).		✓	-
@WARNING_CH1_VALUE	BSTR	Ch1 . Warning value		✓	-
@WARNING_CH1_UNIT	BSTR	Ch1 . Unit of present value		✓	-
@WARNING_CH1_UPPER_LIMIT	BSTR	Ch1 . Upper bound value		✓	-
@WARNING_CH1_LOWER_LIMIT	BSTR	Ch1 . Lower bound value		✓	-
@WARNING_CH2_NUM	I4	Ch2 . Channel number		✓	-
@WARNING_CH2_STATE	I4	Ch2 . State of warning		✓	-
		0	: Uncertainty		
		1	: Normality (There is not warning).		
		2	: Warning that exceeds the upper bound value is being generated.		
		3	: Warning that falls below the lower bound value is being generated.		
		4	: The sensor error warning is being generated.		
@WARNING_CH2_NAME	BSTR	Ch2 . Channel name		✓	-
@WARNING_CH2_UNIX_TIME	I4	Ch2 . Time (world agreement time (UTC) passage second number from January 1, 1970)		✓	-

Variable identifier	Data type	Explanation	Attribute	
			get	put
@WARNING_CH2_ID	I4	Ch2 . Identification number One increase whenever warning is generated (Return to 0 when 255 is exceeded).	✓	-
@WARNING_CH2_VALUE	BSTR	Ch2 . Warning value	✓	-
@WARNING_CH2_UNIT	BSTR	Ch2 . Unit of present value	✓	-
@WARNING_CH2_UPPER_LIMIT	BSTR	Ch2 . Upper bound value	✓	-
@WARNING_CH2_LOWER_LIMIT	BSTR	Ch2 . Lower bound value	✓	-

3. Command reference

3.1. CaoController class

Table3-1CaoController class command list

Command	Function	Page
HTTP server operation		
Start	Start the HTTP server.	P. 25
Stop	Stop the HTTP server.	P. 26
Restart	Restart the HTTP server.	P. 26

3.1.1. CaoController::Execute ("Start") command

Start the HTTP server and put it into the state of [risun].

Format Start(<DEST_URI >,[<TYPE>],[<ON_MESSAGE>])

DEST_URI : In indispensability. Specify address URI of the HTTP server.
(VT_BSTR)

TYPE Specify the language type.
0 : JP (default value)
1 : EU
2 : US

ON_MESSAGE Specify the presence of the message when POST responds.
(default: TRUE)

Return value : Out TRUE: Method success and FALSE: Method failure
- When the HTTP server executes it at the [risun] state, FALSE is restored.

Usage

example

```
var param = new string[] { "http://192.168.3.42:80/", "0", "TRUE" };
var result = this.ctrl.Execute("Start", param);
```

* If you specify an unset URI in ACL setting in DEST_URI,An error of "Access is denied" is thrown.

After the above, the return value of the execution results of Stop command (3.1.2) and Restart command (3.1.3) will return FALSE until this command is executed by specifying the registered URL in ACL setting.

3.1.2. GaoController::Execute ("Stop") command

Stop the HTTP server and put it into the halt condition.

Format Stop ()

Return value : Out TRUE: Method success and FALSE: Method failure

Usage

example

```
var result = this.ctrl.Execute("Stop", null);
```

3.1.3. GaoController::Execute ("Restart") command

Restart with Kon [risun]ed it the HTTP server soon, and put it into the state of [risun].

Format Restart()

Return value : Out TRUE: Method success and FALSE: Method failure
- When the HTTP server executes it at the [risun] state, FALSE is restored.

Usage

example

```
var result = this.ctrl.Execute("Restart", null);
```

4. Sample program

When the value is set, and I4 is acquired from the system variable "@FLG_VALUE" of CaoExtenion.. sample(C#) is shown as follows.

List 4-1

```

Abbreviation.
using ORiN2.interop.CAO;

namespace TandDSample
{
    public partial class Sample : Form
    {
        private CaoEngine engine;
        private CaoWorkspaces wss;
        private CaoWorkspace ws;
        private CaoControllers ctrls;
        private CaoController ctrl;
        private CaoVariable value;

        public Sample()
        {
            InitializeComponent();
        }

        private void Sample_Load(object sender, EventArgs e)
        {
            // Generation of Cao engine
            this.engine = new CaoEngine();
            this.wss = this.engine.Workspaces;
            this.ws = this.wss.Item(0);
            this.ctrls = this.ws.Controllers;

            // Optional character string
            var option = "DEST_URI=http://192.168.3.42:80/,TYPE=0,ON_MESSAGE=TRUE";

            // Add Controller of TR-7wf/nw.
            this.ctrl = this.ws.AddController("Sample",
                                           "CaoProv.TandD.TR7nw",
                                           "",
                                           option);

            // Add Extenion.
            var extOption = "IP=192.168.3.81";
            this.extention =this.ctrl.AddExtension("test", extOption);

            // Add the variable for the access.
            this.value =this.extention.AddVariable("@FLG_VALUE");
        }

        private void btnPut_Click(object sender, EventArgs e)
        {
            // Set of value
            this.value.Value = int.Parse(txtItemValue.Text);
        }

        private void btnGet_Click(object sender, EventArgs e)
        {
            // Get of value
            Int val = (int)this.value.Value;
        }
    }
}

```

```
        txtItemValue.Text = val.ToBSTR();
    }

private void Sample_FormClosing(object sender, FormClosingEventArgs e)
{
    // Opening of object related to Cao
    this.ctrls.Clear();
    if (this.ctrl != null)
    {
        System.Runtime.InteropServices.Marshal.ReleaseComObject(this.ctrl);
        this.ctrl = null;
    }

    this.wss.Clear();

    if (this.ctrls != null)
    {
        System.Runtime.InteropServices.Marshal.ReleaseComObject(this.ctrls);
        this.ctrls = null;
    }

    if (this.ws != null)
    {
        System.Runtime.InteropServices.Marshal.ReleaseComObject(this.ws);
        this.ws = null;
    }

    if (this.wss != null)
    {
        System.Runtime.InteropServices.Marshal.ReleaseComObject(this.wss);
        this.wss = null;
    }

    if (this.engine != null)
    {
        System.Runtime.InteropServices.Marshal.ReleaseComObject(this.engine);
        this.engine = null;
    }
}
}
}
```

5. Supplementation

5.1. ACL setting

The ACL setting of address URI is necessary to use the HTTP server function.

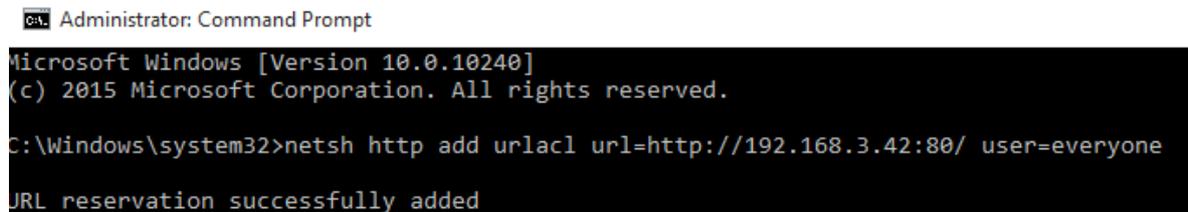
5.1.1. Addition

It is necessary to add the ACL setting of address URI to use the HTTP server function. Start the command prompt by the manager authority, and execute the following command.

```
netsh http add urlacl url=http://[IP address or host name]:[Port number]/ user=everyone
```

- The content specified for above-mentioned url

It is specified in DEST_URI option of CaoWorkspace :: AddController method.



```
Administrator: Command Prompt
Microsoft Windows [Version 10.0.10240]
(c) 2015 Microsoft Corporation. All rights reserved.
C:\Windows\system32>netsh http add urlacl url=http://192.168.3.42:80/ user=everyone
URL reservation successfully added
```

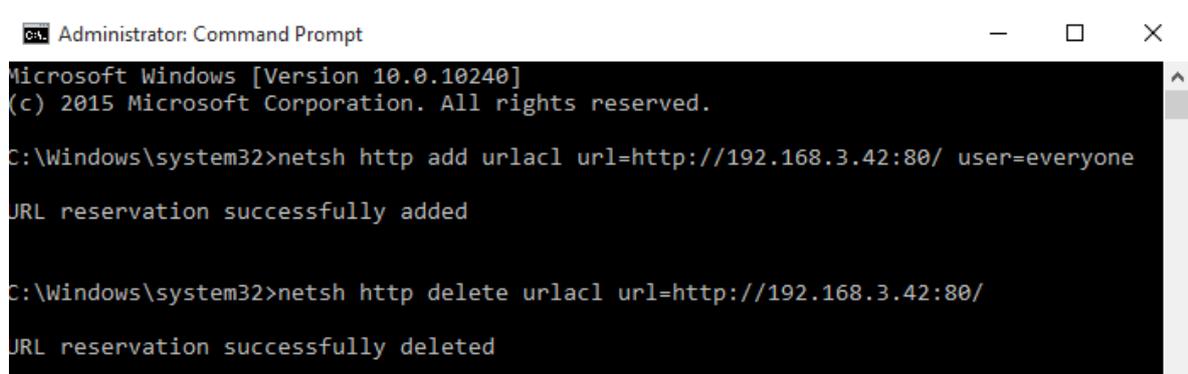
Figure5-1ACL setting (addition)

5.1.2. Deletion

When a wrong ACL setting is added or the ACL setting is deleted

Start the command prompt by the manager authority, and execute the following command.

```
netsh http delete urlacl url=http:// [IP address or host name]:[Port number]/
```



```
Administrator: Command Prompt
Microsoft Windows [Version 10.0.10240]
(c) 2015 Microsoft Corporation. All rights reserved.
C:\Windows\system32>netsh http add urlacl url=http://192.168.3.42:80/ user=everyone
URL reservation successfully added

C:\Windows\system32>netsh http delete urlacl url=http://192.168.3.42:80/
URL reservation successfully deleted
```

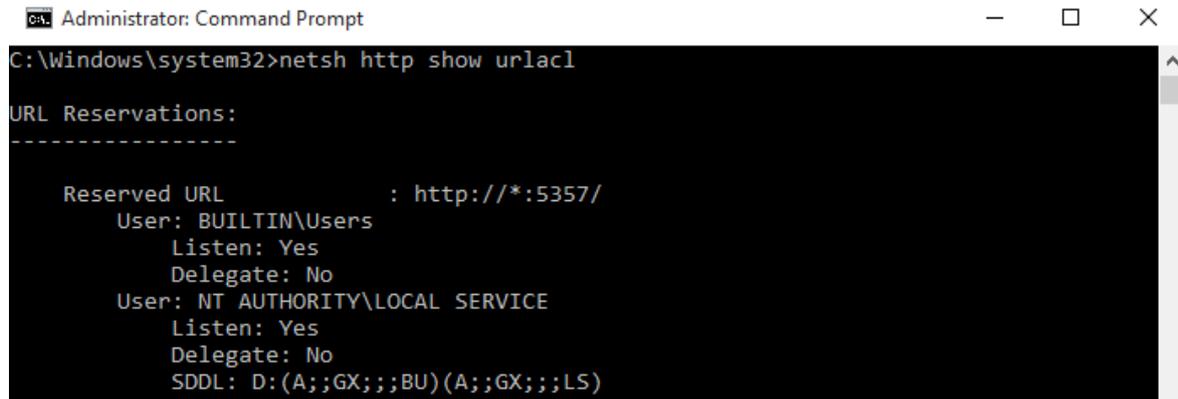
Figure5-2ACL setting (deletion)

5.1.3. Confirmation

When you confirm the ACL setting

Start the command prompt by the manager authority, and execute the following command.

```
netsh http show urlacl
```



```
Administrator: Command Prompt
C:\Windows\system32>netsh http show urlacl

URL Reservations:
-----

Reserved URL           : http://*:5357/
  User: BUILTIN\Users
  Listen: Yes
  Delegate: No
  User: NT AUTHORITY\LOCAL SERVICE
  Listen: Yes
  Delegate: No
  SDDL: D:(A;;;GX;;;BU)(A;;;GX;;;LS)
```

Figure5-3ACL setting (confirmation)

5.2. Firewall setting

In order to use the HTTP server function, you need permission to receive and send the port number specified in ACL setting. The setting example for Windows is shown.

In Explorer,

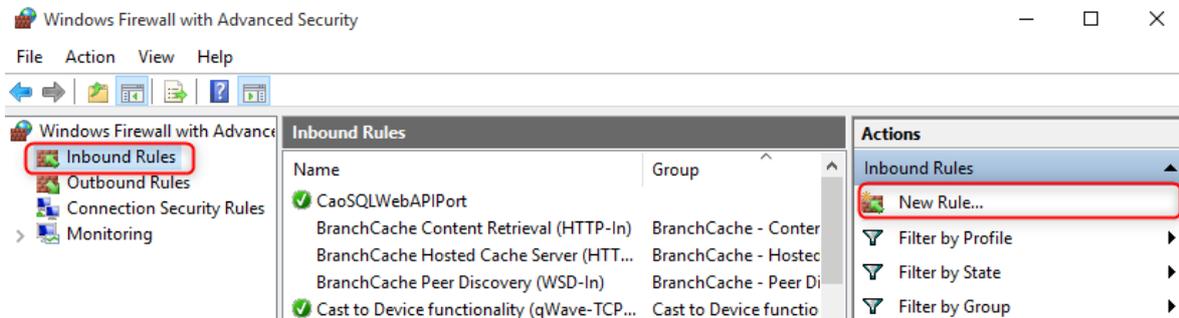
Display control panel > system and security > Windows Defender firewall.

Click a detailed setting.

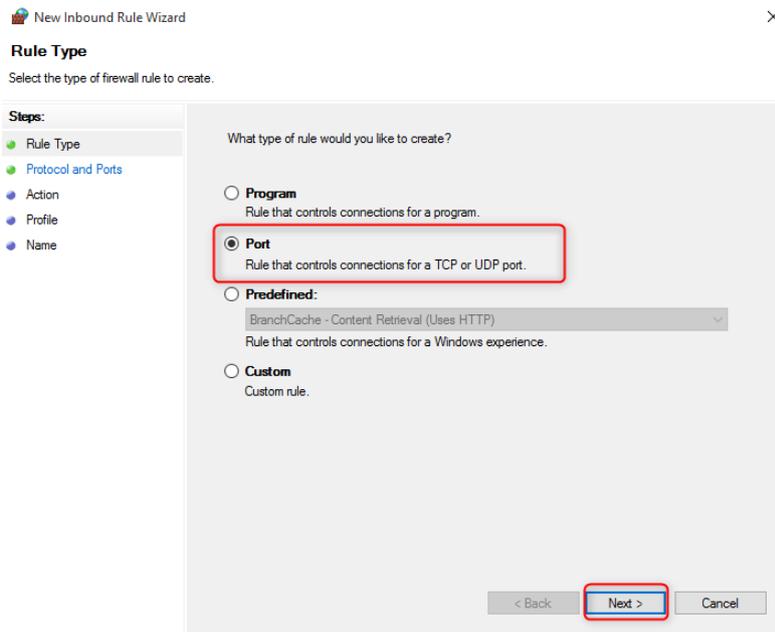


Click a new rule after clicking the rule of the reception.

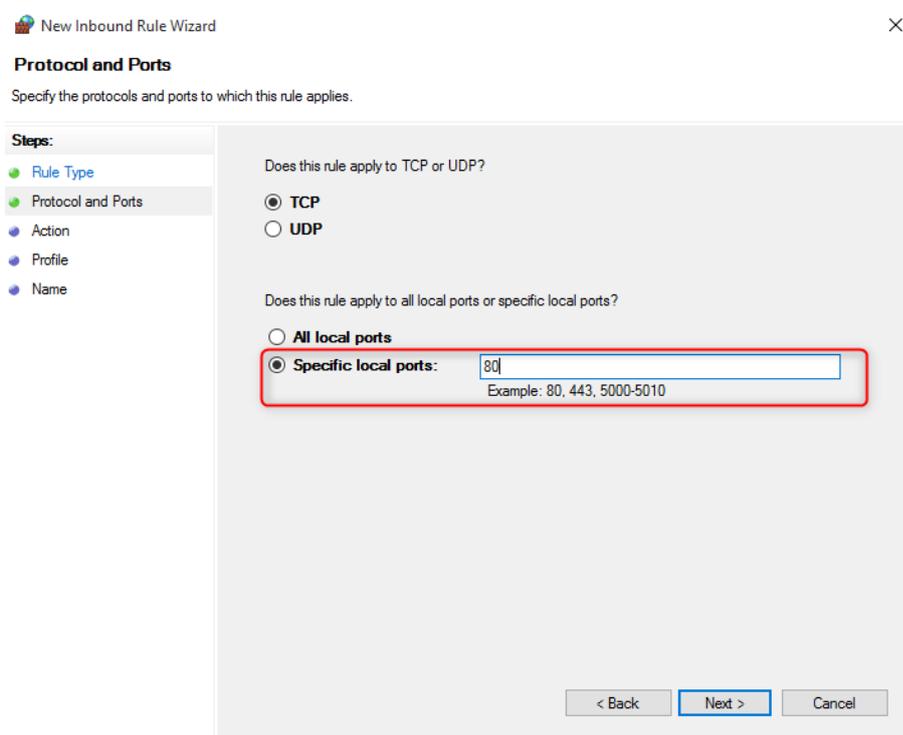
- The rule of the transmission is similar the following procedures.



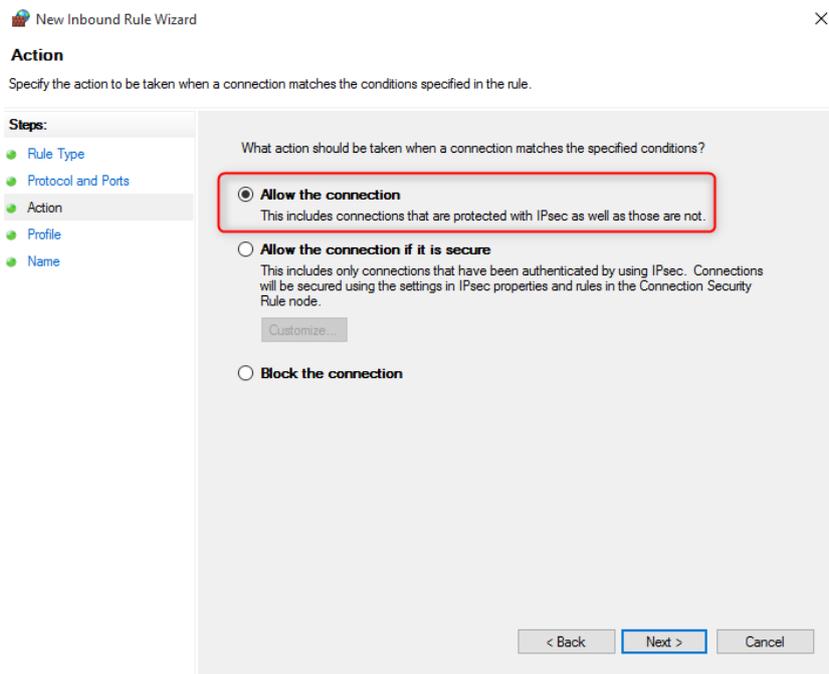
Select the port, and click next.



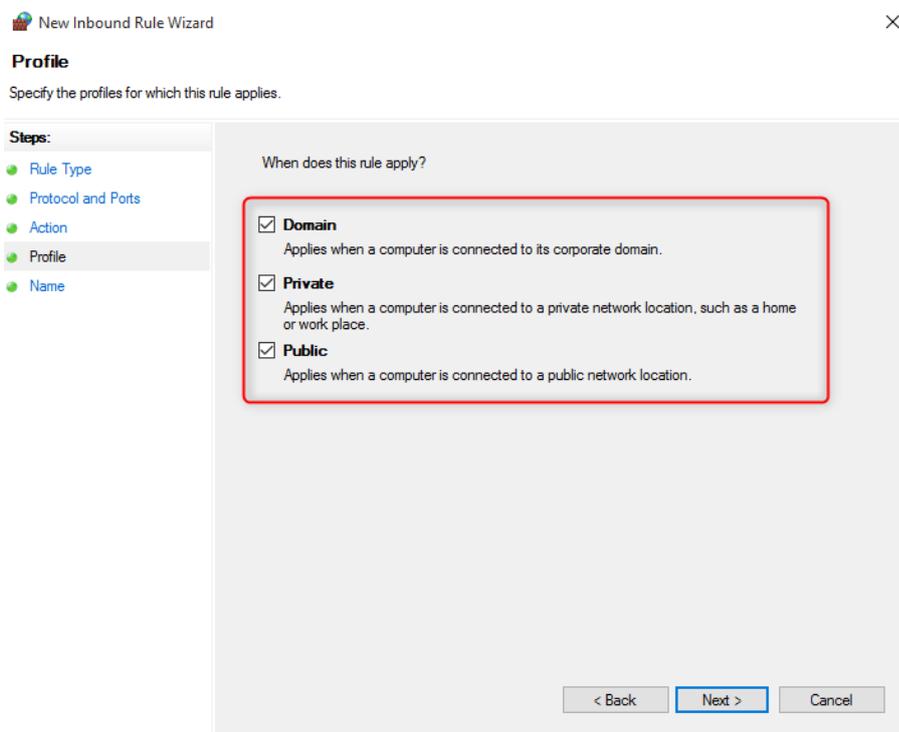
Enter the port number specified in ACL settings and click Next.



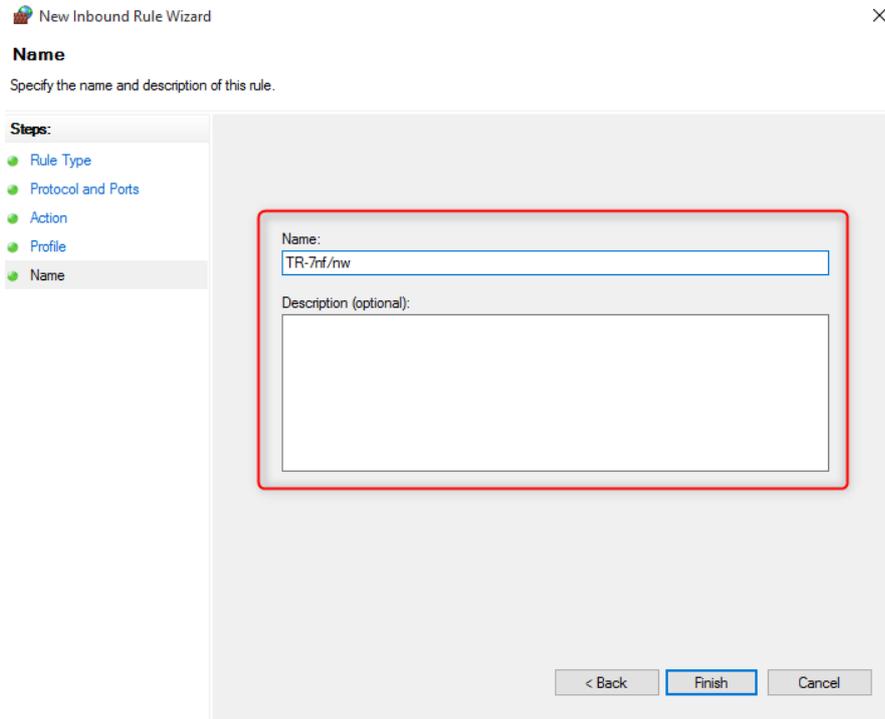
Select Allow the connection, and click next



Apply the check in necessary coverage, and click next.



Input the name and the explanation, and click completion.



The rule added to the rule of the reception is displayed and confirm it is effective.



5.3. Scale conversion type

This section describes @ CURRENT_DATA_CH1_SCALE_EXPR and @ CURRENT_DATA_CH2_SCALE_EXPR of current value data.

The scale conversion type is a conversion type when measurements are displayed by another unit. The value of the scale conversion type is described by the following rule.

1. Changing line (0x0A) is assumed to be a delimiter. Changing line is written at the following as ¥n.
2. It inclines in the changing line delimitation, and the cut, the significant digit, and the unit are described.
3. Changing line is sure to be included in the value of the scale conversion type by four characters.
4. When the scale is not converted, it is assumed, "¥n¥n¥n¥n".
5. When the significant digit is 0, it describes it without processing it concerning the significant digit.

(example)

Tilt 3.368

Section 1.285

Significant digit 4

Unit kgf / cm²

3.368¥n1.285¥n4¥nkgf/cm²¥n

(example)

Do not scale

¥n¥n¥n¥n